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## >> DNA Patents

### US Patent and Trademark Office DNA Vaccine-Related Patents (US Only) - Most Recent First -

**6,451,593**  
10/24/02

Title: Design principle for construction of expression constructs for gene therapy

Inventors: Wittig; Burghardt (Berlin, DE); Junghans; Claas (Berlin, DE)

Assignee: Soft Gene GmbH (Berlin, DE)

Abstract: The invention concerns an expressible nucleic acid construct, which contains only the sequence information necessary for expressing a gene for RNA or protein synthesis. Expression constructs of this type can be used in gene therapy and genetic vaccination and avoid many of the risks associated with constructs today. The invention further concerns the possibility of improving the conveying of the construct into cells or tissue by covalent linkage of the construct, for example to particles or peptides.

**6,426,334**  
7/30/02

Title: Oligonucleotide mediated specific cytokine induction and reduction of tumor growth in a mammal

Inventors: Agrawal; Sudhir (Shrewsbury, MA); Zhao; Qiuyan (Worcester, MA)

Assignee: Hybridon, Inc. (Cambridge, MA)

Abstract: The invention provides new methods for modulating specific CMI-inducing cytokines in vivo. Such new methods result in stimulation of the cytokines IL-6, IL-12 MIP-1.beta. and MCP without substantially inducing undesired cytokines. The methods according to the invention are based upon administration of oligonucleotides containing particular structural motifs which lead to specific cytokine induction.

**6,413,942**  
7/2/02

Title: Methods of delivering a physiologically active polypeptide to a mammal

Inventors: Felgner; Philip L. (Rancho Santa Fe, CA); Wolff; Jon Asher (Madison, WI); Rhodes; Gary H. (Leucadia, CA); Malone; Robert Wallace (Chicago, IL); Carson; Dennis A. (Del Mar, CA)

Assignee: Vical, Inc. (San Diego, CA); Wisconsin Alumni Research Foundation (Madison, WI)

Abstract: A method for delivering an isolated polynucleotide to the interior of a cell in a vertebrate, comprising the interstitial introduction of an isolated polynucleotide into a tissue of the vertebrate where the polynucleotide is taken up by the cells of the tissue and exerts a therapeutic effect on the vertebrate. The method can be used to deliver a therapeutic polypeptide to the cells of the vertebrate, to provide an immune response upon in vivo translation of the polynucleotide, to deliver antisense polynucleotides, to deliver receptors to the cells of the vertebrate, or to provide transitory gene therapy.

**6,413,935**  
7/2/02

Title: Induction of immune response against desired determinants

Inventors: Sette; Alessandro (La Jolla, CA); Gaeta; Federico (San Rafael, CA); Grey; Howard M. (La Jolla, CA); Sidney; John (San Diego, CA); Alexander; Jeffrey L. (San Diego, CA)

Assignee: Epimmune Inc. (San Diego, CA)

Abstract: The present invention provides compositions and methods of inducing immune response in patients. In particular, it provides compositions useful in inducing humoral responses against desired immunogens, particularly polysaccharides.

**6,413,516**  
7/2/02

Title: Peptides and methods against psoriasis

Inventors: Chang; Jennie C. C. (San Marcos, CA); Brostoff; Steven W. (Carlsbad, CA); Carlo; Dennis J. (Rancho Santa Fe, CA)

Assignee: The Immune Response Corporation (Carlsbad, CA)

Abstract: This invention relates to methods of preventing or reducing the severity of psoriasis. In one embodiment, the method involves administering to the individual a peptide having substantially the sequence of a non-conserved region sequence of a T cell receptor, present on the surface of T cells mediating psoriasis or a fragment thereof, wherein the peptide or fragment is capable of causing an effect on the immune system to regulate the T cells. In particular, the T cell receptor has the V.beta. region-V.beta.3, V.beta.13.1 or V.beta.17. In another embodiment, the method involves gene therapy. The invention also relates to methods of diagnosing psoriasis by determining the presence of psoriasis predominant T cell receptors.

**6,410,312**  
6/25/02

Title: huBUB3 gene involved in human cancers

Inventors: Seeley; Todd W. (Moraga, CA)

Assignee: Chiron Corporation (Emeryville, CA)

Abstract: Methods are provided for assessing mutations and/or loss of the huBUB3 gene in human tumors. Loss of wild-type huBUB3 genes is involved in neoplastic development. Therapeutic regimens can be planned on the basis of the mutational status of huBUB3.

**6,410,241**  
6/25/02

Title: Methods of screening open reading frames to determine whether they encode polypeptides with an ability to generate an immune response

Inventors: Sykes; Kathryn F. (Dallas, TX); Johnston; Stephen Albert (Dallas, TX)

Assignee: Board of Regents, The University of Texas System (Austin, TX)

Abstract: The present invention relates to linear expression elements (LEEs) and circular expression elements (CEEs), which are useful in a variety of molecular biology protocols. Specifically, the invention relates to the use of LEEs and CEEs to screen for gene function, biological effects of gene function, antigens, and promoter function. The invention also provides methods of producing proteins, antibodies, antigens, and vaccines. Also, the invention relates to methods of making LEEs and CEEs, and LEEs and CEEs produced by such methods.

**6,406,719**

6/18/02

Title: Encapsulation of bioactive agents

Inventors: Farrar; Graham Henry (Salisbury, GB); Tinsley-Brown; Anne Margaret (Salisbury, GB); Jones; David Hugh (Montreal, CA)

Assignee: Microbiological Research Authority (GB)

Abstract: Bioactive agent is encapsulated in a polymer microparticle in a (water-in-oil)-in-water emulsion-based method, and using a solvent that comprises ethyl acetate. Also described are microparticles comprising low inherent viscosity (i.v.) PLG, some with i.v. less than 0.5 dl/g, and methods for their preparation. DNA release is modified through use of low i.v. PLG. A particle production method for scale-up uses a blender that avoids excessive shear damage to DNA being encapsulated.

**6,406,705**

6/18/02

Title: Use of nucleic acids containing unmethylated CpG dinucleotide as an adjuvant

Inventors: Davis; Heather L. (Ottawa, CA); Schorr; Joachim (Hilden, DE); Krieg; Arthur M. (Iowa City, IA)

Assignee: University of Iowa Research Foundation (Iowa City, IA); Coley Pharmaceutical GmbH (Langenfeld, DE); Ottawa Health Research Institute (Ottawa, CA)

Abstract: The present invention relates generally to adjuvants, and in particular to methods and products utilizing a synergistic combination of immunostimulatory oligonucleotides having at least one unmethylated CpG dinucleotide (CpG ODN) and a non-nucleic acid adjuvant. Such combinations of adjuvants may be used with an antigen or alone. The present invention also relates to methods and products utilizing immunostimulatory oligonucleotides having at least one unmethylated CpG dinucleotide (CpG ODN) for induction of cellular immunity in infants.

**6,395,714**

5/28/02

Title: Expressing gp140 fragment of primary HIV-1 isolate

Inventors: Sia; Charles D. Y. (Thornhill, CA); Cao; Shi Xian (Etobicoke, CA); Persson; Roy (North York, CA); Rovinski; Benjamin (Thornhill, CA)

Assignee: Aventis Pasteur Limited (Toronto, CA)

Abstract: A vector for eliciting an immune response to a host comprising a gene encoding the gp140 protein of the primary isolate of HIV-1, BX08, under the control of a promoter for expression of the protein in the host, specifically plasmid pCMV.gp140.BX08. Murine and human MHC class 1-restricted binding motifs contained in BX08 are identified.

**6,391,632**

5/21/02

Title: Recombinant alphavirus-based vectors with reduced inhibition of cellular macromolecular synthesis

Inventors: Dubensky, Jr.; Thomas W. (Del Mon, CA); Polo; John M. (Encinitas, CA); Belli; Barbara A. (San Diego, CA); Schlesinger; Sondra (St. Louis, MO); Dryga; Sergey A. (Fort Collins, CO); Frolov; Ilya (St. Louis, MO)

Assignee: Chiron Corporation (Emeryville, CA); Washington University (St. Louis, MO)

Abstract: Isolated nucleic acid molecules are disclosed, comprising an alphavirus nonstructural protein gene which, when operably incorporated into a recombinant alphavirus particle, eukaryotic layered vector initiation system, or RNA vector replicon, has a reduced level of vector-specific RNA synthesis, as compared to wild-type, and the same or greater level of proteins encoded by RNA transcribed from the viral junction region promoter, as is compared to a wild-type recombinant alphavirus particle. Also disclosed are RNA vector replicons, alphavirus vector constructs, and eukaryotic layered vector initiation systems which contain the above-identified nucleic acid molecules.

**6,387,888**

5/14/02

Title: Immunotherapy of cancer through expression of truncated tumor or tumor-associated antigen

Inventors: Mincheff; Milcho S. (Rockville, MD); Loukinov; Dmitri I. (Germantown, MD); Zoubak; Serguei (Germantown, MD)

Assignee: American Foundation for Biological Research, Inc. (Rockville, MD)

Abstract: DNA constructs for truncated forms of cancer-specific or cancer associated antigens are included in plasmid or viral expression vectors. The rationale to use constructs for truncated and not for full-size molecules is to eliminate side effects (toxicity, signal transduction etc.) arising from expressed proteins and/or, in cases where such molecules are expressed on the membrane, secreted, or released in the extracellular environment, to prevent formation of antibodies against them. The extracellular portion of the human prostate specific membrane specific antigen (XC-PSMA) has been cloned. Patients were treated either by injection of DNA coding for XC-PSMA in a mammalian expression vector under the CMV promoter or/and by a replication-defective adenoviral vector (Ad5) that contains an expression cassette for the XC-PSMA. In a third method dendritic cells are isolated from a patient and are treated by exposure to the plasmid or adenovirus used in the previous two treatments. The dendritic cells are then injected into the patient. In some patients, the progression of metastatic prostate cancer is retarded or stopped.

**6,384,018**

5/7/02

Title: Polynucleotide tuberculosis vaccine

Inventors: Content; Jean (Rhode-Saint-Genese, BE); Huygen; Kris (Brussels, BE); Liu; Margaret A. (Rosemont, PA); Montgomery; Donna (Chalfont, PA); Ulmer; Jeffrey (Chalfont, PA)

Assignee: Merck & Co., Inc. (Rahway, NJ)

Abstract: Genes encoding Mycobacterium tuberculosis (M.tb) proteins were cloned into eukaryotic expression vectors to express the encoded proteins in mammalian muscle cells in vivo. Animals were immunized by injection of these DNA constructs, termed polynucleotide vaccines or PNV, into their muscles. Immune antisera was produced against M.tb antigens. Specific T-cell responses were detected in spleen cells of vaccinated mice and the profile of cytokine secretion in response to antigen 85 was indicative of a T.sub.h 1 type of helper T-cell response (i.e., high IL-2 and IFN-gamma.). Protective efficacy of an M.tb DNA vaccine was demonstrated in mice after challenge with M.bovis BCG, as measured by a reduction in mycobacterial multiplication in the spleens and lungs of M.tb DNA-vaccinated mice compared to control DNA-vaccinated mice or primary infection in naive mice.

**6,383,496**

- 5/7/02      Title: Recombinant vaccines comprising immunogenic attenuated bacteria having RPOS positive phenotype  
Inventors: Curtiss, III; Roy (St. Louis, MO); Nickerson; Cheryl A. (River Ridge, LA)  
Assignee: Washington University (St. Louis, MO)  
Abstract: Attenuated immunogenic bacteria having an RpoS.sup.+ phenotype, in particular, Salmonella enterica serotype Typhi having an RpoS.sup.+ phenotype and methods therefor are disclosed. The Salmonella have in addition to an RpoS.sup.+ phenotype, an inactivating mutation in one or more genes which render the microbe attenuated, and a recombinant gene capable of expressing a desired protein. The Salmonella are attenuated and have high immunogenicity so that they can be used in vaccines and as delivery vehicles for genes and gene products. Also disclosed are methods for preparing the vaccine delivery vehicles.
- 6,379,965  
4/30/02      Title: Multifunctional complexes for gene transfer into cells comprising a nucleic acid bound to a polyamine and having an endosome disruption agent  
Inventors: Boutin; Raymond H. (Thornton, PA)  
Assignee: American Home Products Corporation (Madison, NJ)  
Abstract: A method of delivering a multifunctional molecular complex for the transfer of a nucleic acid composition to a target cell is provided. The complex is comprised of a) said nucleic acid composition and b) a transfer moiety comprising 1) one or more cationic polyamines bound to said nucleic acid composition, 2) one or more endosome membrane disrupting components attached to at least one nitrogen of the polyamine and 3) one or more receptor specific binding components
- 6,376,652  
4/23/02      Title: Compositions and methods involving an essential Staphylococcus aureus gene and its encoded protein  
Inventors: Pelletier; Jerry (Baie-D'Urfe, CA); Gros; Philippe (St. Lambert, CA); DuBow; Mike (Montreal, CA)  
Assignee: Phagotech, Inc. (Quebec, CA)  
Abstract: This invention relates to newly identified polynucleotides and polypeptides, and their production and uses, as well as their variants, agonists and antagonists, and their uses. In particular, the invention relates to polynucleotides and polypeptides of a Staphylococcus aureus (S. aureus) Dnal related protein, as well as its variants, hereinafter referred to as "S. aureus Dnal", "S. aureus Dnal polypeptide(s)", and "S. aureus dnal polynucleotides" as the case may be. Also, the invention relates to a specific interaction between the S. aureus Dnal related protein and a growth-inhibitory protein encoded by the S. aureus bacteriophage 77 genome. The phage ORF product interacts with the S. aureus Dnal polypeptide, and the invention contemplates use of this interaction target site for the basis of a drug screening assay. In addition, the invention relates to polynucleotides and polypeptides of a protein complex containing S. aureus Dnal and DnaC related proteins, as well as their variants.
- 6,372,722  
4/16/02      Title: Method for nucleic acid transfection of cells  
Inventors: Bennett; Michael J. (El Sobrante, CA); Rothman; Stephan S. (Berkeley, CA); Nantz; Michael H. (Davis, CA)  
Assignee: Genteric, Inc. (Alameda, CA)  
Abstract: The present invention describes methods for introducing nucleic acids into a target cell using a transition metal enhancer. A mixture containing nucleic acid and a transition metal enhancer is exposed to cells. The nucleic acid is taken up into the interior of the cell with the aid of the transition metal enhancer. Since nucleic acids can encode a gene, the method can be used to replace a missing or defective gene in the cell. The method can also be used to deliver exogenous nucleic acids operatively coding for proteins that are secreted or released from target cells, thus resulting in a desired biological effect outside the cell. Alternatively, the methods of the present invention can be used to deliver exogenous nucleic acids into a target cell that are capable of regulating the expression of a predetermined endogenous gene. This can be accomplished by encoding the predetermined endogenous gene on the nucleic acid or by encoding the nucleic acid with a sequence that is the Watson-Crick complement of the mRNA corresponding to the endogenous gene.
- 6,372,224  
4/16/02      Title: Canine coronavirus S gene and uses therefor  
Inventors: Miller; Timothy J. (Lincoln, NE); Klepfer; Sharon (Broomall, PA); Reed; Albert Paul (Exton, PA); Jones; Elaine V. (Wynnewood, PA)  
Assignee: Pfizer Inc. (New York, NY)  
Abstract: The present invention provides the amino acid and nucleotide sequences of a CCV spike gene, and compositions containing one or more fragments of the spike gene and encoded polypeptide for prophylaxis, diagnostic purposes and treatment of CCV infections.
- 6,365,377  
4/2/02      Title: Recombination of insertion modified nucleic acids  
Inventors: Patten; Phillip A. (Mountain View, CA); Heinrichs; Volker (Mountain View, CA); Stemmer; Willem P. C. (Los Gatos, CA)  
Assignee: Maxygen, Inc. (Redwood City, CA)  
Abstract: Methods of modulating, tuning and improving hybridization properties and recombination properties of molecules for use in nucleic acid shuffling procedures, relates recombination mixtures and methods of modulating, tuning, improving and evolving splicing of RNAs and proteins are provided.
- 6,361,991  
3/26/02      Title: Targeting gene expression to living tissue using jet injection  
Inventors: Furth; Priscilla Anne (Chevy Chase, MD); Hennighausen; Lothar (Chevy Chase, MD)  
Assignee: The United States of America as represented by the Department of Health and (Washington, DC)  
Abstract: The present invention provides a method of targeting transient gene expression and stable gene expression from the exogenous administration of a DNA sequence, which sequence is less than a complete genome, wherein said DNA sequence encodes RNA and protein, or RNA only, to differentiate tissue of living organisms wherein said DNA sequence through a jet injector technique, and said DNA sequence of less than a complete genome is expressed in a living organism. The present invention further provides a flexible multi-nozzle injector device with a wide surface area to allow molding of the injector nozzle to the surface contours of the tissue. Another aspect of the present invention provides an injection device having a long nozzle for injection of DNA deep into the host tissue. Also, in a further aspect the present invention provides an injector device modified to be used with and/or inject through an endoscopic device.
- 6,358,933      Title: Formulation of nucleic acid and acemannan

- 3/19/02  
Inventors: Aguilar Rubido; Julio Cesar (Habana, CU); Muzio Gonzalez; Verena Lucila (Habana, CU); Guillen Nieto; Gerardo Enrique (Habana, CU); Penton Arias; Eduardo (Habana, CU); Leal Angulo; Maria de Jesus (Habana, CU); Pichardo Diaz; et al.  
Assignee: Centro de Ingenieria Genetica Y Biotecnologia (Habana, CU)  
Abstract: The present invention is for a formulation comprising a nucleic acid vaccine and an immunoenhancing amount of acemannan, whereby the acemannan enhances immune response, in a host, to the vaccine. The present invention is also for a method of enhancing the immune response of a host to a nucleic acid vaccine by administering a formulation comprising a nucleic acid vaccine and acemannan.
- 6,355,247**  
3/12/02  
Title: Nucleic acid immunization using a virus-based infection/transfection system  
Inventors: Selby; Mark (San Francisco, CA); Walker; Christopher (Novato, CA)  
Assignee: Chiron Corporation (Emeryville, CA)  
Abstract: A method for nucleic acid immunization which results in a cell-mediated immunological response to a selected antigen is disclosed. The method utilizes the T7 RNA infection/transfection system which provides for the controlled, transient cytoplasmic expression of a given antigen and which elicits the production of class I MHC restricted CTLs.
- 6,355,246**  
3/12/02  
Title: Feline calicivirus isolated from cat urine and vaccines thereof  
Inventors: Kruger; John M. (Okemos, MI); Maes; Roger K. (Okemos, MI); Vilnis; Aivars (late of East Lansing, MI)  
Assignee: Board of Trustees of Michigan State University (East Lansing, MI)  
Abstract: The present invention provides an isolated feline calicivirus and mutants thereof, which were isolated from the urine of a cat with lower urinary tract disorder. The present invention further provides nucleic acid clones of the virus, in particular, a clone which encodes the capsid antigen of the virus. The present invention is useful for providing a live or killed virus vaccine comprising the virus or mutants thereof, a subunit vaccine comprising the capsid antigen of the virus, a nucleic acid vaccine encoding the capsid antigen of the virus, and a recombinant virus vector vaccine encoding the capsid antigen of the virus. The present invention also provides a method for isolating feline calicivirus from urine and an assay for diagnosing cats infected with feline calicivirus.
- 6,350,456**  
2/26/02  
Title: Compositions and methods for the prevention and treatment of M. tuberculosis infection  
Inventors: Reed; Steven G. (Bellevue, WA); Skeiky; Yasir A. W. (Seattle, WA); Dillon; Davin C. (Redmond, WA)  
Assignee: Corixa Corporation (Seattle, WA)  
Abstract: Compositions and methods for treatment and vaccination against tuberculosis are disclosed. In one aspect the compositions provided include at least two polypeptides that contain an immunogenic portion of a M. tuberculosis antigen or at least two DNA molecules encoding such polypeptides. In a second aspect, the compositions provided include a fusion protein comprising at least two polypeptides that contain an immunogenic portion of a M. tuberculosis antigen. Such compositions may be formulated into vaccines and/or pharmaceutical compositions for immunization against M. tuberculosis infection, or may be used for the diagnosis of tuberculosis.
- 6,348,582**  
2/19/02  
Title: Prokaryotic polynucleotides polypeptides and their uses  
Inventors: Black; Michael Terence (Le Vesinet, FR); Hodgson; John Edward (Paris, FR); Knowles; David Justin Charles (Boroughbridge, GB); Reichard; Raymond Winfield (Quakertown, PA); Nicholas; Richard O (Collegeville, PA); et al  
Assignee: SmithKline Beecham Corporation (Philadelphia, PA); SmithKline Beecham plc (Brentford, GB)  
Abstract: The invention provides novel polypeptides and polynucleotides encoding such polypeptides and methods for producing such polypeptides by recombinant techniques. Also provided are methods for utilizing such polypeptides to screen for antibacterial compounds.
- 6,348,578**  
2/19/02  
Title: Apt  
Inventors: Lonetto; Michael Arthur (Collegeville, PA); Nicholas; Richard Oakley (Collegeville, PA); Brown; James Raymond (Berwyn, PA); Black; Michael Terence (Chester Springs, PA); Hodgson; John Edward (Malvern, PA); et al  
Assignee: SmithKline Beecham Corporation (Philadelphia, PA); SmithKline Beecham plc (GB)  
Abstract: The invention provides apt polypeptides and DNA (RNA) encoding apt polypeptides and methods for producing such polypeptides by recombinant techniques. Also provided are methods for utilizing apt polypeptides to screen for antibacterial compounds.
- 6,348,450**  
2/19/02  
Title: Noninvasive genetic immunization, expression products therefrom and uses thereof  
Inventors: Tang; De-chu C. (Birmingham, AL); Marks; Donald H. (Rockaway, NJ); Curiel; David T. (Birmingham, AL); Shi; Zhongkai (Birmingham, AL); van Kampen; Kent Rigby (Hoover, AL)  
Assignee: The UAB Research Foundation (Birmingham, AL)  
Abstract: Disclosed and claimed are methods of non-invasive genetic immunization in an animal and/or methods of inducing a systemic immune or therapeutic response in an animal, products therefrom and uses for the methods and products therefrom. The methods can include contacting skin of the animal with a vector in an amount effective to induce the systemic immune or therapeutic response in the animal. The vector can include and express an exogenous nucleic acid molecule encoding an epitope or gene product of interest. The systemic immune response can be to or from the epitope or gene product. The nucleic acid molecule can encode an epitope of interest and/or an antigen of interest and/or a nucleic acid molecule that stimulates and/or modulates an immunological response and/or stimulates and/or modulates expression, e.g., transcription and/or translation, such as transcription and/or translation of an endogenous and/or exogenous nucleic acid molecule; e.g., one or more of influenza hemagglutinin, influenza nuclear protein, tetanus toxin C-fragment, anthrax protective antigen, HIV gp 120, human carcinoembryonic antigen, and/or a therapeutic, an immunomodulatory gene, such as co-stimulatory gene and/or a cytokine gene. The immune response can be induced by the vector expressing the nucleic acid molecule in the animal's cells. The immune response can be against a pathogen or a neoplasm. A prophylactic vaccine or a therapeutic vaccine or an immunological composition can include the vector.
- 6,348,449**  
2/19/02  
Title: Methods of inducing mucosal immunity  
Inventors: Weiner; David B. (Merion, PA); Wang; Bin (Havertown, PA); Ugen; Kenneth E. (Philadelphia, PA)

Assignee: The Trustees of the University of Pennsylvania (Philadelphia, PA)

**Abstract:** Methods of inducing mucosal immunity in individuals against proteins and peptides are disclosed. The methods comprise the step of administering topically or by lavage into mucosal tissue selected from the group consisting of rectal, vaginal, urethral, sublingual and buccal, a nucleic acid molecule that comprises a nucleotide sequence that encodes a protein or peptide that comprises an epitope against which mucosal immunity is desired. The methods may be used to immunize an individual against a pathogen infection, hyperproliferative diseases or autoimmune diseases using nucleic acid molecules which encode proteins and peptides that share an epitope with a pathogen antigen or protein associated with cells involved in hyperproliferative diseases or autoimmune diseases, respectively.

**6,344,540**  
2/7/02

**Title:** PAI

**Inventors:** Black; Michael Terence (Chester Springs, PA); Hodgson; John Edward (Malvern, PA); Knowles; David Justin Charles (Redhill, GB); Reichard; Raymond Winfield (Quakertown, PA); Nicholas; Richard Oakley (Collegeville, PA); Burnham; Martin Karl Russel

**Assignee:** SmithKline Beecham Corporation (Philadelphia, PA); SmithKline Beecham plc (GB)

**Abstract:** The invention provides pai polypeptides and DNA (RNA) encoding pai polypeptides and methods for producing such polypeptides by recombinant techniques. Also provided are methods for utilizing pai polypeptides to screen for antibacterial compounds.

**6,344,201**  
2/7/02

**Title:** Methods of identifying bacterial genes that are incompatible with bacterial pathogenicity, and the use of such genes, such as cadA, to reduce pathogenicity in a bacteria or to combat pathogenic bacterial infections

**Inventors:** Maurelli; Anthony T. (1429 Winding Waye La., Silver Spring, MD 20902); Fernandez; Reinaldo E. (3115 Whispering Pines Dr. Apt. #41, Silver Spring, MD 20906); Bloch; Craig A. (1125 Ferdon Rd., Ann Arbor, MI 48104); Fasano; Alessio (3128 River Vall

**Assignee:**

**Abstract:** "Black holes" in the genomes of bacterial pathogens represent deletions of "anti-virulence" genes, i.e. genes that are detrimental to a pathogenic lifestyle. Identification of the missing genetic loci in the "black hole" identifies genes that are incompatible with the bacteria's pathogenicity. These genes, their gene products, and compounds generated by the enzymatic action of these gene products represent potential new compounds that are inhibitory to the bacterial pathogen and thus useful as pharmaceuticals. The utility of this concept is demonstrated in the missing gene for lysine decarboxylase, and the resulting inhibitory activity of cadaverine (the diaminoalkyl reaction product of lysine decarboxylase) on the Shigella enterotoxins. Diaminoalkyl compounds are therefore potent inhibitors of E. coli and Shigella spp. enterotoxins. Lysine decarboxylase generated from the gene cadA results in attenuation of the enterotoxic effects. New methods of use of diaminoalkyl compounds as medicaments are described. New uses of genetic constructs containing a cadA sequence, or other "anti-virulence" gene, for biochemical probes, for toxin receptor identification, and for pharmaceutical discovery are described. Additional uses are described for vaccines and DNA vaccine delivery.

**6,342,352**  
1/29/02

**Title:** Method of detecting shigella and shigella mxIM DNA

**Inventors:** Schuch; Raymond (Washington, DC); Sandlin; Robin C. (Columbia, MD); Maurelli; Anthony T. (Silver Spring, MD)

**Assignee:** The Henry M. Jackson Foundation for the Advancement of Military Medicine (Rockville, MD)

**Abstract:** The present invention relates to our discovery that the mxIM protein of Shigella flexneri is indispensable for the spread of Shigella from cell to cell. Thus, the invention provides the mxIM protein or peptides or portions thereof as antigens in vaccines to prevent Shigella infections and treat hosts infected with Shigella by inhibiting intercellular spread. In another aspect, the invention relates to antibodies generated against the mxIM proteins, peptides, or portions thereof to detect Shigella in contaminated food and water supplies as well as in infected hosts. The present invention also describes a method called the TIER (test of intracellular expression requirements) for determining the intracellular expression requirements of genes and therefore, permitting one to establish the role of genes in the pathogenesis of organisms. A method of detecting Shigella or Shigella mxIM DNA in a sample using a mxIM DNA probe is also described.

**6,340,463**  
1/22/02

**Title:** Identification of antigenic peptide sequences

**Inventors:** Mitchell; William M. (Nashville, TN); Stratton; Charles W. (Nashville, TN)

**Assignee:** Vanderbilt University (Nashville, TN)

**Abstract:** Identification of linear amino acid antigenic sequences for the production of both polyclonal and monoclonal antibodies to defined antigenic domains is described. Also described are antigenic peptides identified by the described methods and antibodies thereto.

**6,339,068**  
1/15/02

**Title:** Vectors and methods for immunization or therapeutic protocols

**Inventors:** Krieg; Arthur M. (Iowa City, IA); Davis; Heather L. (Ottawa, CA); Wu; Tong (Hull, CA); Schorr; Joachim (Hilden, DE)

**Assignee:** University of Iowa Research Foundation (Iowa City, IA); Loeb Health Research Institute at the Ottawa Hospital (Ottawa, CA); Coley Pharmaceutical GmbH (Langenfeld, DE)

**Abstract:** The present invention shows that DNA vaccine vectors can be improved by removal of CpG-N motifs and optional addition of CpG-S motifs. In addition, for high and long-lasting levels of expression, the optimized vector should include a promoter/enhancer that is not down-regulated by the cytokines induced by the immunostimulatory CpG motifs. Vectors and methods of use for immunostimulation are provided herein. The invention also provides improved gene therapy vectors by determining the CpG-N and CpG-S motifs present in the construct, removing stimulatory CpG (CpG-S) motifs and/or inserting neutralizing CpG (CpG-N) motifs, thereby producing a nucleic acid construct providing enhanced expression of the therapeutic polypeptide. Methods of use for such vectors are also included herein.

**6,339,065**  
1/15/02

**Title:** Episomal expression vector for human gene therapy

**Inventors:** Cooper; Mark J. (Solon, OH)

**Assignee:** Case Western Reserve University (Cleveland, OH)

**Abstract:** Episomal plasmids containing a papovavirus origin of replication and a papovavirus large T antigen mutant form are shown to replicate episomally in human cells, and yield levels of gene expression proportional to their episomal copy number. In conjunction with liposomal or receptor-mediated delivery systems, papovavirus-derived episomal plasmids provide an alternative vector for gene therapy, particularly when utilizing strategies requiring high levels of gene expression.

- 6,322,780**  
11/27/01  
Title: Marek's disease virus vaccines for protection against Marek's disease  
Inventors: Lee L, Nazerian K, Witter R, Wu P, Yanagida N, Yoshida S  
Assignee: The United States of America as represented by the Secretary of Agriculture (Washington, DC); Nippon Zeon Co., Ltd. (Tokyo, JP)  
Abstract:
- 6,316,420**  
11/13/01  
Title: DNA cytokine vaccines and use of same for protective immunity against multiple sclerosis  
Inventors: Karin N, Youssef S, Wildbaum G  
Assignee: Technion Research and Development Foundation LTD. (Haifa, IL)  
Abstract:
- 6,312,956**  
11/6/01  
Title: Nuclear targeted peptide nucleic acid oligomer  
Inventors: Lane K  
Assignee: Vanderbilt University (Nashville, TN)  
Abstract:
- 6,312,915**  
11/6/01  
Title: Tick (Ixodes scapularis) vector saliva-induced Lyme disease spirochete (Borrelia burgdorferi) antigens as vaccine candidates  
Inventors: Nelson D, Mather T, Scorpio A  
Assignee: The Board of Governors for Higher Education, State of Rhode Island (Providence, RI); Providence Plantations (Providence, RI)  
Abstract:
- 6,306,404**  
10/23/01  
Title: Adjuvant and vaccine compositions containing monophosphoryl lipid A  
Inventors: LaPosta V, Eldridge J  
Assignee: American Cyanamid Company (Madison, NJ)  
Abstract:
- 6,294,372**  
9/25/01  
Title: Replication genes and gene products from small cryptic plasmids and methods for constructing controlled-replication plasmid vectors  
Inventors: Burian J, Kay W  
Assignee: University of Victoria Innovation & Dev. Corp. (British Columbia, CA)  
Abstract:
- 6,290,969**  
9/18/01  
Title: Compounds and methods for immunotherapy and diagnosis of tuberculosis  
Inventors: Reed S, Skeiky Y, Dillon D, Campos-Neto A, Houghton R, Vedvick T, Twardzik D  
Assignee: Corixa Corporation (Seattle, WA)  
Abstract:
- 6,287,856**  
9/11/01  
Title: Vaccines against circovirus infections  
Inventors: Poet S, Ritchie B, Niagro F, Lukert P  
Assignee: University of Georgia Research Foundation, Inc. (Athens, GA)  
Abstract:
- 6,287,817**  
9/11/01  
Title: Fusion proteins for protein delivery  
Inventors: Davis; Pamela B. (Cleveland Heights, OH); Ferkol; Thomas (Concord, OH); Eckman; Elizabeth (Ponte Vedra Beach, FL); Schreiber; John (Gates Mills, OH); Luk; John M. (South Horizons, HK)  
Assignee: Case Western Reserve University (Cleveland, OH)  
Abstract: A protein conjugate consisting of antibody directed at the plgR and A.sub.1 AT can be transported specifically from the basolateral surface of epithelial cells to the apical surface. This approach provides us with the ability to deliver a therapeutic protein directly to the apical surface of the epithelium, by targeting the plgR with an appropriate ligand. Thus, the highest concentration of the antiprotease will be at the apical surface, where it can do the greatest good in accelerating the inflammatory response.
- 6,287,569**  
9/11/01  
Title: Vaccines with enhanced intracellular processing  
Inventors: Kipps T, Wu Y  
Assignee: The Regents of the University of California (La Jolla, CA)  
Abstract:
- 6,284,533**  
9/4/01  
Title: Plasmid-based vaccine for treating atherosclerosis  
Inventors: Thomas L  
Assignee: AVANT Immunotherapeutics, Inc. (Needham, MA)  
Abstract:
- 6,280,977**  
Title: Method for generating transcriptionally active DNA fragments

- 8/28/01  
Inventors: Liang X, Felgner P  
Assignee: Gene Therapy Systems (San Diego, CA)  
Abstract:
- 6,270,795**  
8/7/01  
Title: Method of making microencapsulated DNA for vaccination and gene therapy  
Inventors: Jones D, Farrar G, Clegg J  
Assignee: Microbiological Research Authority (GB)  
Abstract:
- 6,261,787**  
7/17/01  
Title: Bifunctional molecules for delivery of therapeutics  
Inventors: Davis; Pamela B. (Cleveland heights, OH); Ferkol, Jr.; Thomas W. (Concord, OH); Eckman; Elizabeth (Ponte Vedra Beach, FL)  
Assignee: Case Western Reserve University (Cleveland, OH)  
Abstract: A bifunctional molecule consisting of a therapeutic molecule and a ligand which specifically binds a transcytotic receptor can be transported specifically from the basolateral surface of epithelial cells to the apical surface. This approach provides the ability to deliver a therapeutic molecule directly to the apical surface of the epithelium, by targeting the transcytotic receptor with an appropriate ligand. Thus, the highest concentration of the therapeutic molecule will be at the apical surface, where it can have the greatest therapeutic effect.
- 6,261,281**  
7/17/01  
Title: Method for genetic immunization and introduction of molecules into skeletal muscle and immune cells  
Inventors: Mathiesen I, Tollefsen S  
Assignee: Inovio (NO)  
Abstract:
- 6,258,788**  
7/10/01  
Title: DNA vaccines against tick-borne flaviviruses  
Inventors: Schmaljohn C  
Assignee: The United States of America as represented by the Secretary of the Army (Washington, DC)  
Abstract:
- 6,254,869**  
7/3/01  
Title: Cryptopain vaccines, antibodies, proteins, peptides, DNA and RNA for prophylaxis, treatment and diagnosis and for detection of cryptosporidium species  
Inventors: Petersen C, Huang J  
Assignee: The Regents of the University of California (Oakland, CA)  
Abstract:
- 6,251,872**  
6/26/01  
Title: Nucleic acid vaccines for ehrlichia chaffeensis and methods of use  
Inventors: Barbet A, Ganta R, McGuire T, Burrige M, Nyika A, Rurangirwa F, Mahan S, Bowie M, Alleman A  
Assignee: University of Florida (Gainesville, FL)  
Abstract:
- 6,242,220**  
6/5/01  
Title: Method for purifying covalently closed circular DNA  
Inventors: Wahle S, Schorr J, Weber M  
Assignee: Qiagen GmbH (Hilden, DE)  
Abstract:
- 6,239,116**  
5/29/01  
Title: Immunostimulatory nucleic acid molecules  
Inventors: Krieg A, Kline J  
Assignee: University of Iowa Research Foundation (Iowa City, IA); Coley Pharmaceutical Group, Inc. (Wellesley, MA); The United States of America as represented by the Department of Health and Human Services (Washington, DC)  
Abstract:
- 6,235,523**  
5/22/01  
Title: Vectors for DNA immunization against cervical cancer  
Inventors: Gajewczyk D, Persson R, Yao F, Cao S, Klein M, Tartaglia J, Moingeon P, Rovinski B  
Assignee: Connaught Laboratories Limited (Toronto, CA)  
Abstract:
- 6,235,290**  
5/22/01  
Title: DNA immunization against chlamydia infection  
Inventors: Brunham R  
Assignee: University of Manitoba (Winnipeg, CA)  
Abstract:
- 6,228,621**  
5/8/01  
Title: Plasmids encoding immunogenic proteins and intracellular targeting sequences  
Inventors: Williams W, Madaio M, Weiner D



- Assignee: The Trustees of the University of Pennsylvania (Philadelphia, PA)  
Abstract:
- 6,221,959**  
4/24/01  
Title: Polynucleotide compositions  
Inventors: Kabanov A, Alakov V, Vinogradov S  
Assignee: Supratek Pharma, Inc. (Montreal, CA)  
Abstract:
- 6,221,664**  
4/24/01  
Title: Composite vaccine which contains antigen, antibody and recombinant DNA and its preparing method  
Inventors: Wen Y, He L, Qu D  
Assignee: Shanghai Medical University (Shanghai, CN)  
Abstract:
- 6,217,883**  
4/17/01  
Title: Porcine circovirus and paravovirus vaccine  
Inventors: Allan G, Meehan B, Ellis J, Krakowka G, Audonnet J  
Assignee: Meril (Lyons, FR); The Queen's University of Belfast (Belfast, GB); University of Saskatchewan (Saskatoon, CA)  
Abstract:
- 6,214,804**  
4/10/01  
Title: Induction of a protective immune response in a mammal by injecting a DNA sequence  
Inventors: Felgner P, Wolff J, Rhodes G, Malone R, Carson D  
Assignee: Vical Incorporated (San Diego, CA)  
Abstract:
- 6,210,663**  
4/3/01  
Title: Methods of augmenting mucosal immunity through systemic priming and mucosal boosting  
Inventors: Ertl H  
Assignee: The Wistar Institute of Anatomy and Biology (Philadelphia, PA)  
Abstract:
- 6,207,646**  
3/27/01  
Title: Immunostimulatory nucleic acid mole  
Inventors: Krieg A, Kline J, Klinman D, Steinberg A  
Assignee: University of Iowa Research Foundation (Iowa City, IA); Coley Pharmaceutical Group, Inc. (Wellesley, MA); The United States of America as represented by the Department of Health and Human Services (Washington, DC)  
Abstract:
- 6,204,250**  
3/20/01  
Title: Immunization of infants  
Inventors: Bot A, Constantin B  
Assignee: The Mount Sinai Medical Center of the City of New York (New York, NY)  
Abstract:
- 6,203,801**  
3/20/01  
Title: Coccidiosis polypeptide and vaccines  
Inventors: Schaap T, Kuiper C, Vermeulen A  
Assignee: Akzo Nobel N.V. (Arnhem, NL)  
Abstract:
- 6,190,701**  
2/20/01  
Title: Composition and method for stable injectable liquids  
Inventors: Roser B, Garcia De Castro A, Maki J  
Assignee: Peter M. Ronai (Salem, OR)  
Abstract:
- 6,187,759**  
2/13/01  
Title: Canine parvovirus DNA vaccination  
Inventors: Tarpey I, Greenwood N  
Assignee: Akzo Nobel N.V. (Arnhem, NL)  
Abstract:
- 6,187,321**  
2/13/01  
Title: Avian E. coli lss polypeptide  
Inventors: Nolan L, Horne S, Robinson M  
Assignee: North Dakota State University (Fargo, ND)  
Abstract:
- 6,180,614**  
1/30/01  
Title: DNA based vaccination of fish  
Inventors: Davis H

Assignee: Loeb Health Research Institute at The Ottawa Hospital (Ottawa, CA)

Abstract:

**6,180,114**  
1/30/01

Title: Therapeutic delivery using compounds self-assembled into high axial ratio microstructures

Inventors: Yager P, Gelb M, Lukyanov A, Goldstein A, Disis M

Assignee: University of Washington (Seattle, WA)

Abstract:

**6,174,872**  
1/16/01

Title: Method for treating allergic lung disease

Inventors: Carson D, Raz E

Assignee: The Regents of the University of California (Oakland, CA)

Abstract:

**6,165,993**  
12/31/69

Title: DNA vaccines against rotavirus infections

Inventors: Herman JE, Robinson HL, Fynan EF

Assignee: University of Massachusetts Medical Center (Worcester, MA)

Abstract:

**6,165,720**  
12/26/00

Title: Chemical modification of DNA using peptide nucleic acid conjugates

Inventors: Felgner P, Zelphati O, Bennet F

Assignee: Gene Therapy Systems (San Diego, CA); Isis Pharmaceuticals, Inc. (Carlsbad, CA)

Abstract:

**6,153,200**  
11/28/00

Title: Vaccine compositions and methods useful in inducing immune protection against arthritogenic peptides involved in the pathogenesis of rheumatoid arthritis

Inventors: Carson D, Albani S

Assignee: The Regents of the University of California (Oakland, CA)

Abstract:

**6,150,170**  
11/21/00

Title: Method for introducing and expressing genes in animal cells, and live invasive bacterial vectors for use in the same

Inventors: Powell R, Lewis G, Hone D

Assignee: University of Maryland at Baltimore (Baltimore, MD)

Abstract:

**6,133,244**  
10/17/00

Title: Method for immunization against hepatitis B

Inventors: Michel ML, Mancini M

Assignee: Institut Pasteur (Paris, FR); Institute National de la Sante et la Recherche Medicale (Paris, FR)

Abstract:

**6,127,344**  
10/3/00

Title: Polynucleotide immunogenic agents

Inventors: Amici A, Concetti A, Venanzi F

Assignee: Universita'Degli Studi di Camerino (Camerino, IT)

Abstract:

**6,127,116**  
10/3/00

Title: Functional DNA clone for hepatitis C virus (HCV) and uses thereof

Inventors: Rice C, Kolykhalov A

Assignee: Washington University (St. Louis, MO)

Abstract:

**6,110,898**  
8/29/00

Title: DNA vaccines for eliciting a mucosal immune response

Inventors: Malone R, Malone J

Assignee: University of Maryland, Baltimore (Baltimore, MD)

Abstract:

**6,110,161**  
8/29/00

Title: Method for introducing pharmaceutical drugs and nucleic acids into skeletal muscle

Inventors: Mathiesen I, Lomo T

Assignee: Inovio (NO)

Abstract:

**6,090,790**  
7/18/00

Title: Gene delivery by microneedle injection

Inventors: Eriksson E (5 Lanark Rd., Wellesley Hills, MA 02181)

Assignee:

Abstract:

**6,090,392**  
7/18/00

Title: HIV envelope polypeptides and vaccine

Inventors: Berman P

Assignee: Genetech, Inc. (South San Francisco, CA)

Abstract:

**6,087,341**  
7/11/00

Title: Induction of nucleic acid into skin cells by topical application

Inventors: Khavari P, Fan H

Assignee: The Board of Trustees of the Leland Stanford Junior University (Palo Alto, CA)

Abstract:

**6,087,163**  
7/11/00

Title: Mycobacterium tuberculosis specific proteins and genes, mixtures of antigens and uses thereof

Inventors: Gennaro M, Lyashchenko K, Manca C

Assignee: The Public Health Research Institute of the City of New York, Inc. (New York, NY)

Abstract:

**6,086,891**  
12/31/69

Title: Bi-functional plasmid that can act as both a DNA vaccine and a recombinant virus vector

Inventors: Hurwitz J, Coledough C

Assignee: St. Jude Children's Research Hospital

Abstract:

**6,080,849**  
6/27/00

Title: Genetically modified tumor-targeted bacteria with reduced virulence

Inventors: Bermudes D, Low K

Assignee: Vion Pharmaceuticals, Inc. (New Haven, CT); Yale University (New Haven, CT)

Abstract:

**6,077,835**  
6/20/00

Title: Delivery of compacted nucleic acid to cells

Inventors: Hanson; Richard W. (Cleveland Heights, OH); Perales; Jose C. (Cleveland Heights, OH); Ferkol, Jr.; Thomas W. (Euclid, OH)

Assignee: Case Western Reserve University (Cleveland, OH); Ohio University (Athens, OH)

Abstract: Nucleic acids are compacted, substantially without aggregation, to facilitate their uptake by target cells of an organism to which the compacted material is administered. The nucleic acids may achieve a clinical effect as a result of gene expression, hybridization to endogenous nucleic acids whose expression is undesired, or site-specific integration so that a target gene is replaced, modified or deleted. The targeting may be enhanced by means of a target cell-binding moiety. The nucleic acid is preferably compacted to a condensed state.

**6,074,865**  
6/13/00

Title: Recombinant dengue virus DNA fragment

Inventors: Kelly E, King A

Assignee: The United States of America as represented by the Secretary of the Army (Washington, DC)

Abstract:

**6,072,041**  
6/6/00

Title: Fusion proteins for protein delivery

Inventors: Davis; Pamela B. (Cleveland Heights, OH); Ferkol; Thomas (Concord, OH); Eckman; Elizabeth (Ponte Vedra Beach, FL); Schreiber; John (Gates Mills, OH); Luk; John M. (South Horizons, HK)

Assignee: Case Western Reserve University (Cleveland, OH)

Abstract: A protein conjugate consisting of antibody directed at the pIgR and A.sub.1 AT can be transported specifically from the basolateral surface of epithelial cells to the apical surface. This approach provides us with the ability to deliver a therapeutic protein directly to the apical surface of the epithelium, by targeting the pIgR with an appropriate ligand. Thus, the highest concentration of the antiprotease will be at the apical surface, where it can do the greatest good in accelerating the inflammatory response.

**6,066,623**  
5/23/00

Title: Polynucleotide vaccine protective against malaria, methods of protection and vector for delivering polynucleotide vaccines

Inventors: Hoffman; Stephen L. (Gaithersburg, MD); Hedstrom; Richard C. (Gaithersburg, MD); Sedegah; Martha (Gaithersburg, MD)

Assignee: The United States of America as represented by the Secretary of the Navy (Washington, DC)

Abstract: A first embodiment is a specific plasmid vector, pDIP/PyCSP.1, into which nucleotides encoding the targets of specific immune responses are inserted. These targets include, but are not limited to proteins and peptides. These plasmid constructs are incorporated in a composition comprising a suitable and acceptable art recognized pharmaceutical reagent that is benign (non-reactive with) to the plasmid construct. The plasmid construct provides protective immune responses to the disease associated with the selected targets. A second embodiment is a construct having, at a minimum, the nucleotide sequences encoding one or more Plasmodium species proteins in a pharmaceutically acceptable vector. A third embodiment is a method of controlling malaria in mammals comprising injecting a polynucleotide delivery vector into a mammal.

**6,063,385**  
5/16/00

Title: DNA vaccine for parvovirus

Inventors: Schultz R

- Assignee: Wisconsin Alumni Research Foundation  
Abstract:
- 6,025,338**  
2/15/00  
Title: Nucleic acid vaccines against rickettsial diseases and methods of use  
Inventors: Barbet A, Ganta R, Burrigge M, Mahan S  
Assignee: University of Florida (Gainesville, FL)  
Abstract:
- 6,020,465**  
2/1/00  
Title: Recombinant avian type I interferon  
Inventors: Sekellick M, Marcus P, Ferrandino A  
Assignee: University of Connecticut (Farmington, CT)  
Abstract:
- 6,020,319**  
2/1/00  
Title: Nucleic acid based immunotherapy of chronic hepatitis B infection  
Inventors: Prince A, Brotman B  
Assignee: New York Blood Center (New York, NY)  
Abstract:
- 6,015,795**  
1/18/00  
Title: Bovine viral diarrhea virus II vaccine and method of immunization  
Inventors: van den Hurk J, Tijssen P  
Assignee: Biostar, Inc. (Saskatoon, CA)  
Abstract:
- 6,013,268**  
1/11/00  
Title: Methods for enhancement of protective immune responses  
Inventors: Reed S  
Assignee: Corixa Corporation (Seattle, WA)  
Abstract:
- 6,008,336**  
12/28/99  
Title: Compacted nucleic acids and their delivery to cells  
Inventors: Hanson; Richard W. (Cleveland Heights, OH); Perales; Jose C. (Cleveland Heights, OH); Ferkol; Thomas W. (Euclid, OH)  
Assignee: Case Western Reserve University (Cleveland, OH); Ohio University (Athens, OH)  
Abstract: Nucleic acids are compacted, substantially without aggregation, to facilitate their uptake by target cells of an organism to which the compacted material is administered. The nucleic acids may achieve a clinical effect as a result of gene expression, hybridization to endogenous nucleic acids whose expression is undesired, or site-specific integration so that a target gene is replaced, modified or deleted. The targeting may be enhanced by means of a target cell-binding moiety. The nucleic acid is preferably compacted to a condensed state.
- 6,004,799**  
12/21/99  
Title: Recombinant live feline immunodeficiency virus and proviral DNA vaccines  
Inventors: Luciw P, Sparger E  
Assignee: The Regents of the University of California (Oakland, CA)  
Abstract:
- 6,001,361**  
12/14/99  
Title: Mycobacterium vaccae antigens  
Inventors: Tan P, Hiyama J, Visser E, Skinner M, Scott L, Prestidge R  
Assignee: Genesis Research & Development Corporation Limited (Parnell, NZ)  
Abstract:
- 5,989,553**  
11/23/99  
Title: Expression library immunization  
Inventors: Johnston S, Barry M, Lai W  
Assignee: Board of Regents, The University of Texas System (Austin, TX)  
Abstract:
- 5,985,285**  
11/16/99  
Title: Vaccines for plague  
Inventors: Titball R, Williamson E, Leary S, Oyston P, Bennett A  
Assignee: The Secretary of State for Defence in Her Britannic Majesty's Government (GB)  
Abstract:
- 5,972,901**  
10/26/99  
Title: Serpin enzyme complex receptor-mediated gene transfer  
Inventors: Ferkol, Jr.; Thomas W. (Euclid, OH); Davis; Pamela B. (Cleveland Heights, OH); Ziady; Assem-Galal (Cleveland Heights, OH)  
Assignee: Case Western Reserve University (Cleveland, OH)  
Abstract: Nucleic acids are compacted, substantially without aggregation, to facilitate their uptake by target cells of an organism to which the compacted material is administered. The nucleic acids may achieve a clinical effect as a result of gene expression,

hybridization to endogenous nucleic acids whose expression is undesired, or site-specific integration so that a target gene is replaced, modified or deleted. The targeting may be enhanced by means of a target cell-binding moiety. The nucleic acid is preferably compacted to a condensed state.

**5,972,900**  
10/26/99

Title: Delivery of nucleic acid to cells

Inventors: Ferkol, Jr.; Thomas W. (Concord, OH); Davis; Pamela B. (Cleveland Heights, OH)

Assignee: Case Western Reserve University (Cleveland, OH)

Abstract: Nucleic acids are compacted, substantially without aggregation, to facilitate their uptake by target cells of an organism to which the compacted material is administered. The nucleic acids may achieve a clinical effect as a result of gene expression, hybridization to endogenous nucleic acids whose expression is undesired, or site-specific integration so that a target gene is replaced, modified or deleted. The targeting may be enhanced by means of a target cell-binding moiety. The nucleic acid is preferably compacted to a condensed state.

**5,972,707**  
10/26/99

Title: Gene delivery system

Inventors: Roy K, Mao H, Truong V, August T, Leong K

Assignee: The Johns Hopkins University (Baltimore, MD)

Abstract:

**5,958,895**  
9/28/99

Title: DNA vaccines for herpes simplex virus

Inventors: Pachuk C, Herold K

Assignee: American Home Products Corporation (Madison, NJ)

Abstract:

**5,955,077**  
9/21/99

Title: Tuberculosis vaccine

Inventors: Andersen P, Andersen A, Haslov K, Sorensen A

Assignee: Statens Serum Institut (Copenhagen, DK)

Abstract:

**5,939,400**  
8/17/99

Title: DNA vaccination for induction of suppressive T cell response

Inventors: Steinman L, Waisman A

Assignee: The Board of Trustees of the Leland Stanford Junior University (Palo Alto, CA)

Abstract:

**5,932,715**  
8/3/99

Title: Nucleotide sequences encoding a CS2 pilin protein

Inventors: Scott J, Froehlich B, Caron J

Assignee: Emory University (Atlanta, GA)

Abstract:

**5,916,879**  
6/29/99

Title: DNA transcription unit vaccine that protect against avian influenza viruses and methods of use thereof

Inventors: Webster R

Assignee: St. Jude Children's Research Hospital (Memphis, TN)

Abstract:

**5,916,754**  
6/29/99

Title: Bayou hantavirus and related methods

Inventors: Nichol S, Morzunov S, Ksiazek T, Rollin P, Spiropoulou C

Assignee: The United States of America as represented by the Department of Health (Washington, DC)

Abstract:

**5,910,488**  
6/8/99

Title: Plasmids suitable for gene therapy

Inventors: Nabel G, Nabel E, Lew D, Marquet M

Assignee: Vical Incorporated (San Diego, CA)

Abstract:

**5,885,567**  
3/23/99

Title: Treatment of infection in fowl by oral administration of avian interferon proteins

Inventors: Sekellick M, Marcus P, Ferrandino A

Assignee: University of Connecticut (Storrs, CT)

Abstract:

**5,880,103**  
3/9/99

Title: Immunomodulatory peptides

Inventors: Urban R, Chiciz R, Vignali D, Hedley M, Stern L, Strominger J

Assignee: President and Fellows of Harvard College (Cambridge, MA)

Abstract:

- 5,879,687**  
3/9/99  
Title: Methods for enhancement of protective immune responses  
Inventors: Reed S  
Assignee: Corixa Corporation (Seattle, WA)  
Abstract:
- 5,877,302**  
3/2/99  
Title: Compacted nucleic acids and their delivery to cell  
Inventors: Hanson; Richard W. (Cleveland Heights, OH); Perales; Jose C. (Cleveland Heights, OH); Ferkol; Thomas W. (Euclid, OH)  
Assignee: Case Western Reserve University (Cleveland, OH); Ohio University (Athens, OH)  
Abstract: Nucleic acids are compacted, substantially without aggregation, to facilitate their uptake by target cells of an organism to which the compacted material is administered. The nucleic acids may achieve a clinical effect as a result of gene expression, hybridization to endogenous nucleic acids whose expression is undesired, or site-specific integration so that a target gene is replaced, modified or deleted. The targeting may be enhanced by means of a target cell-binding moiety. The nucleic acid is preferably compacted to a condensed state.
- 5,877,159**  
3/2/99  
Title: Method for introducing and expressing genes in animal cells and live invasive bacterial vectors for use in the same  
Inventors: Powell R, Lewis G, Hone D  
Assignee: University of Maryland, Baltimore (Baltimore, MD)  
Abstract:
- 5,866,553**  
2/2/99  
Title: Polynucleotide vaccine for papillomavirus  
Inventors: Donnelly J, Liu M, Martinez D, Montgomery D  
Assignee: Merck & Co., Inc. (Rahway, NJ)  
Abstract:
- 5,853,980**  
12/29/98  
Title: Black creek canal hantavirus and related methods  
Inventors: Rollin P, Elliott L, Ksiazek T, Nichol S, Morzunov S, Ravkov E  
Assignee: The United States of America as represented by the Department of Health (Washington, DC); National Institutes of Health Office of Technology Transfer (Bethesda, MD)  
Abstract:
- 5,846,946**  
12/8/98  
Title: Compositions and methods for administering Borrelia DNA  
Inventors: Huebner R, Norman J, Liang X, Carner K, Barbour A, Luke C  
Assignee: Pasteur Merieux Serums et Vaccins (Lyon, FR); Vical Inc. (San Diego, CA); University of Texas Health Science Center (San Antonio, TX)  
Abstract:
- 5,844,107**  
12/1/98  
Title: Compacted nucleic acids and their delivery to cells  
Inventors: Hanson; Richard W. (Cleveland Heights, OH); Perales; Jose C. (Cleveland Heights, OH); Ferkol, Jr.; Thomas W. (Euclid, OH)  
Assignee: Case Western Reserve University (Cleveland, OH)  
Abstract: Nucleic acids are compacted, substantially without aggregation, to facilitate their uptake by target cells of an organism to which the compacted material is administered. The nucleic acids may achieve a clinical effect as a result of gene expression, hybridization to endogenous nucleic acids whose expression is undesired, or site-specific integration so that a target gene is replaced, modified or deleted. The targeting may be enhanced by means of a target cell-binding moiety. The nucleic acid is preferably compacted to a condensed state.
- 5,843,913**  
12/1/98  
Title: Nucleic acid respiratory syncytial virus vaccines  
Inventors: Li X, Ewasyshyn M, Sambhara S, Klein M  
Assignee: Connaught Laboratories Ltd (North York, Canada)  
Abstract:
- 5,840,839**  
11/24/98  
Title: Alternative open reading frame DNA of a normal gene and a novel human cancer antigen encoded therein  
Inventors: Wang R, Rosenberg S  
Assignee: The United States of America as represented by the Secretary of the (Washington, DC)  
Abstract:
- 5,824,538**  
10/20/98  
Title: Shigella vector for delivering DNA to a mammalian cell  
Inventors: Branstrom A, Sizemore D, Sadoff J  
Assignee: The United States of America as represented by the Secretary of the Army (Washington, DC)  
Abstract:
- 5,824,313**  
10/20/98  
Title: Vaccine compositions and method for induction of mucosal immune response via systemic vaccination  
Inventors: Daynes R, Araneo B  
Assignee: University of Utah Research Foundation (Salt Lake City, UT)

- 5,824,309**  
10/20/98  
Abstract:  
Title: Recombinant gas vesicles and uses thereof  
Inventors: DasSarma S, Morshed F, Stuarat E, Black S  
Assignee: University of Massachusetts (Boston, MA)  
Abstract:
- 5,814,617**  
9/29/98  
Title: Protective 17 KDA malaria hepatic and erythrocytic stage immunogen and gene  
Inventors: Hoffman S, Charoenvit Y, Hedstrom R, Doolan D  
Assignee: The United States of America as represented by the Secretary of the Navy (Washington, DC)  
Abstract:
- 5,811,406**  
9/22/98  
Title: Dry powder formulations of polynucleotide complexes  
Inventors: Szoka F, Rolland A, Wang J  
Assignee: Regents of the University of California (Oakland, CA)  
Abstract:
- 5,804,191**  
9/8/98  
Title: Sperm as immunogen carriers  
Inventors: Scofield V (372 Redwood Dr., Pasadena, CA 91105)  
Assignee:  
Abstract:
- 5,780,448**  
7/14/98  
Title: DNA-based vaccination of fish  
Inventors: Davis H  
Assignee: Ottawa Civic Hospital Loeb Research (Ottawa, CA)  
Abstract:
- 5,773,570**  
6/30/98  
Title: Vaccine compositions and methods useful in inducing immune protection against arthritogenic peptides involved in the pathogenesis of rheumatoid arthritis  
Inventors: Carson D, Albani S  
Assignee: The Regents of the University of California (Oakland, CA)  
Abstract:
- 5,736,524**  
4/7/98  
Title: Polynucleotide tuberculosis vaccine  
Inventors: Content J, Huygen K, Liu M, Montgomery D, Ulmer J  
Assignee: Merck & Co., Inc. (Rahway, NJ) N.V. Innogenetics S.A. (Ghent, Belgium)  
Abstract:
- 5,709,865**  
1/20/98  
Title: Immunogenic composition against Bovine Viral Diarrhea Virus II glycoprotein 53 (BVDV-II gp53)  
Inventors: van den Hurk J, Tijssen P  
Assignee: Biostar, Inc. (Saskatoon, CA)  
Abstract:
- 5,707,812**  
1/13/98  
Title: Purification of plasmid DNA during column chromatography  
Inventors: Horn N, Budahazi G, Marquet M  
Assignee: Vical Incorporated (San Diego, CA)  
Abstract:
- 5,703,057**  
12/30/97  
Title: Expression library immunization  
Inventors: Johnston S, Barry M, Lai  
Assignee: Board of Regents, The University of Texas System (Austin, TX)  
Abstract:
- 5,703,055**  
12/30/97  
Title: Generation of antibodies through lipid mediated DNA delivery  
Inventors: Felgner P, Wolff J, Rhodes G, Malone R, Carson D  
Assignee: Wisconsin Alumni Research Foundation (Madison, WI); Vical Incorporated (San Diego, CA)  
Abstract:
- 5,693,622**  
12/12/97  
Title: Expression of exogenous polynucleotide sequences cardiac muscle of a mammal  
Inventors: Wolff J, Duke D, Felgener P  
Assignee: Vical Incorporated (San Diego, CA)

## Abstract:

**5,676,954**  
10/14/97

Title: Method of in vivo delivery of functioning foreign genes

Inventors: Brigham K

Assignee: Vanderbilt University (Nashville, TN)

## Abstract:

**5,641,665**  
6/24/97

Title: Plasmids suitable for IL-2 expression

Inventors: Hobart P, Margalith M, Parker S, Khatibi S

Assignee: Vical Incorporated (San Diego, CA)

## Abstract:

**5,620,896**  
4/15/97

Title: DNA vaccines against rotavirus infections

Inventors: Herrman J, Robinson H, Fynan E

Assignee: University of Massachusetts Medical Center (Worcester, MA)

## Abstract:

**5,595,912**  
1/21/97

Title: Specific DNA and RNA sequences associated with US IBDV variants, vector carrying DNA sequences, host carrying cloned vector, deduced amino acid sequences, vaccine and method of vaccination

Inventors: Vakharia V, Snyder D

Assignee: University of Maryland College Park (College Park, MD)

## Abstract:

**5,593,972**  
1/14/97

Title: Genetic immunization

Inventors: Weiner D, Williams W, Wang B

Assignee: The Wistar Institute (Philadelphia, PA)

## Abstract:

**5,589,466**  
12/31/96

Title: Induction of a protective immune response in a mammal by injecting a DNA sequence

Inventors: Felgner P, Wolff J, Rhodes R, Carson D

Assignee: Vical Incorporated (San Diego, CA)

## Abstract:

**5,580,859**  
12/3/96

Title: Delivery of exogenous DNA sequences in a mammal

Inventors: Felgner P, Wolff J, Rhodes G, Malone R, Carson D

Assignee: Vical Incorporated (San Diego, CA)

## Abstract:

**5,561,064**  
10/1/96

Title: Production of pharmaceutical-grade plasmid DNA

Inventors: Marquet M, Horn N, Meek J, Budahazi G

Assignee: Vical Incorporated (San Diego, CA)

## Abstract:

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